

REMARKS

Applicants have carefully read and considered the Official Action.

A minor amendment to the specification has been made to correct a typographical error in the section referring to treatment of vent gas streams. This amendment merely corrects the destination of the treated stream as specified in paragraph 110 to be consistent with the characterization of the stream as a vent gas stream in paragraph 108. The amendment does not introduce any new matter.

In his action, the Examiner stated that the claims are drawn to four patentably distinct species, A-D, and required applicant to elect a single species for prosecution on the merits. Applicants provisionally elect species C with traverse.

Species C relates to processes for treating fuel gas upstream of a cold box. Claims that are readable on this species are claims 1, 2-6, 9-13, 17, 19-22, 24 and 36-45.

The Examiner has stated that no claim appears to be generic. Applicants submit that claim 1 is generic. Claim 1 has six claim elements, (a) through (f), that are found in all species as follows:

(a) providing a membrane unit having a feed side and a permeate side and containing a membrane selective for helium over nitrogen and helium over methane

Such a membrane unit is shown in the membrane separation step (215) of Figure 2 and as element 307 in Figure 3 [Species A], as a two-stage unit in Figure 4 (409 and 416) [Species B], as a two-stage unit in Figure 5 (509 and 516) [Species C], and as a two-stage, two-step unit in Figure 6 (606, 613, 618), and as element 706 in Figure 7 [Species D].

(b) passing the reject gas stream as a feed stream across the feed side under conditions in which transmembrane permeation occurs

Feed streams that pass to the feed side of the membranes are shown as streams 214, 306, 408, 508, 605 and 705 in the corresponding figures and species. These stream are all examples of a generic reject gas stream as defined in paragraphs 18-19 and 46-49 of applicants' specification.

(c) withdrawing from the feed side as a residue stream a treated reject gas stream depleted in helium compared with the feed stream

Such helium-depleted residue streams are shown as streams 222, 309, 411, 511, 608 and 708 in the corresponding figures and species.

(d) withdrawing from the permeate side as a permeate stream a gas mixture enriched in helium compared with the feed stream

Such helium-enriched permeate streams are shown as streams 217, 310, 419, 519, 616 and 709 in the corresponding figures and species.

(e) disposing of the treated reject gas stream by a method selected from the group consisting of (i) venting, (ii) flaring, (iii) reinjecting, (iv) using as fuel gas and (v) using as purge gas

In Figure 2, Species A, residue stream 222 is sent on for use as purge gas - option (v) of element (e), as is stream 309 of Figure 3.

In Figure 4, Species B, residue stream 411 is sent to purge (this is a typographical error, as this section describes venting, not purging). Nevertheless, venting or use as purge are both listed as options in element (e).

In Figure 5, Species C, residue stream 511 is used as fuel by directing to a combustion fuel intake - option (iv) of element (e).

In Figures 6 and 7, Species D, residue streams 608 and 708 are helium-depleted fuel gas, as in option (iv) of element (e).

(f) disposing of the gas mixture by a method selected from the group consisting of (i) storage, (ii) transport to a helium separation facility, (iii) sale and (iv) return for additional processing within the gas processing plant.

In Figure 2, Species A, permeate stream 217 is stated to be suitable for sale as crude helium and ultimately to be sent to a helium purification plant - option (iii) or (ii) of element (f). Likewise in Figure 3, stream 310 is returned to the product pipeline that is directed to a helium purification plant, as in option (ii).

In Figure 4, Species B, permeate stream 419 is suitable for sale or transport - again option (ii) or (iii).

In Figure 5, Species C, permeate stream 519 is suitable for transport for further processing - option (ii) of element (f).

In Figures 6 and 7, Species D, permeate stream 616 is sent to another location as crude helium for further processing, as in option (ii), and stream 709 is returned within the gas processing plant, as in option (iv).

Applicants submit that the above analysis establishes that claim 1 is generic to all species.

The requirement for election between species is traversed because the species all involve treatment by membrane separation of a helium-containing stream in a gas-processing plant. In all species, the treatment produces a helium-enriched permeate and a helium-depleted residue. The streams to be treated in each process are not essentially different by virtue of their intrinsic properties. What differs between species is the characterization of the stream to be treated as a vent gas, purge gas or fuel gas stream, based on the use for which it has been withdrawn from the main processing train. These types of streams are all explicitly assigned a generic classification as reject gas streams in paragraphs 46-49 of applicants' specification.

In light of the fact that all the processes are carried out by membrane separation in the environment of a gas processing plant and that a generic characterization of the feed stream can be made, it is submitted that examination of all claims together may properly be carried out, as a search within the area of membrane treatment of gas streams in gas processing plants will suffice for all species.

Reconsideration of the election requirement is requested.

Respectfully submitted,



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